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(71) Applicant:
**Automotive Lighting Italia Spa
10078 Venaria Reale (Torino) (IT)**

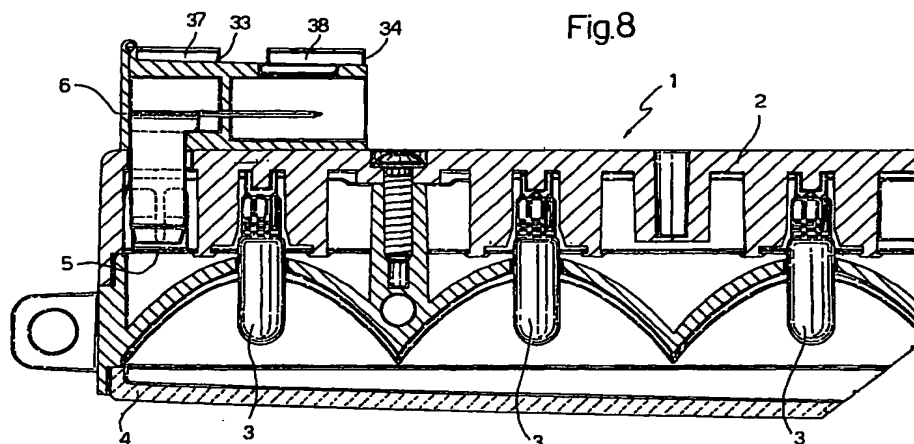
(72) Inventors:
• **Canavesio, Sergio
10044 Pianezza (IT)**
• **Crema, Alessandro
10093 Collegno (IT)**
• **Padovan, Marco
10036 Settimo Torinese (IT)**

(74) Representative:
**Cerbaro, Elena, Dr. et al
STUDIO TORTA S.r.l.,
Via Viotti, 9
10121 Torino (IT)**

(54) **Lighting device, in particular for vehicles**

(57) Lighting device, in particular for vehicles, including a support body, a supply circuit, and a device for connection to a supply line. In turn, the connection device includes connection tabs, which extend integrally from the supply circuit, and a connector body, which is provided with a first and a second socket, which are disposed at an angle relative to one another, and a pair of

plate contacts, which can be inserted in a removable manner, into respective slots of the support body, in order to reach the connection tabs. The plate contacts co-operate in a sliding manner with the tabs, in order to connect the supply circuit electrically to the supply line, via the second socket.



EP 0 999 617 A1

Description

[0001] The present invention relates to a lighting device, in particular for vehicles, for example a light for the third stop unit.

[0002] It is known that devices of this type have a plurality of lamps, which are accommodated in a support body, and are connected electrically to an external supply line, via an internal supply circuit.

[0003] The internal supply circuit, which is supported by the support body, is provided with a pair of terminals.

[0004] A connector, which is disposed at one end of the external supply line, is locked such that a pair of contacts of the connector itself can communicate with the terminals of the internal supply circuit.

[0005] The electrical connection is provided by welding the terminals of the internal supply circuit to the contacts of the connector.

[0006] A disadvantage which is associated with devices of this type concerns the production of the electrical connection between the internal circuit and the external supply line.

[0007] In particular, the welding requires a production process which is complex and costly to carry out, and which, in short, makes fitting of the device onto the car unsuitable for being implemented automatically.

[0008] In addition, any maintenance work which may have to be carried out, such as replacement of the devices, is rendered laborious, and requires a considerable amount of time.

[0009] The object of the present invention is to provide a lighting device which is without the disadvantages described, and which, in particular, is simple and economical to produce.

[0010] According to the present invention, a lighting device is thus provided, in particular a third stop light for vehicles, which comprises a support body, a plurality of lamps, which are supported by the said support body, an internal supply circuit, which is connected electrically to the said lamps, and a device for connection to an external supply line; the said connection device comprising at least one pair of connection tabs, which are electrically connected to the said internal supply circuit; characterised in that the said connection device comprises a connector body, which is provided with a first and a second socket; the said first and second sockets being disposed at an angle relative to one another, and comprising at least a respective first and second pair of plate contacts; the said first pair of plate contacts being insertable, in a removable manner, into respective slots in the said support body, in order to reach the said tabs.

[0011] The advantages which are provided by a lighting device produced according to the invention, are apparent from the foregoing description.

[0012] Firstly, use of a connector with sliding contacts makes superfluous the welding operations for the electrical connection between the internal supply circuit

and the external supply line.

[0013] Thus, fitting of the lighting device on the car is simplified, and is more suitable for being carried out by means of automated processes.

[0014] Consequently, a first economic advantage is obtained.

[0015] In addition, maintenance operations also, such as replacement of a broken or damaged device, are facilitated, since the connection of the device itself to the supply line can be interrupted and restored, simply by removing and reinserting the connector.

[0016] In order to assist understanding of the present invention, a preferred embodiment is described hereinafter, purely by way of non-limiting example, with reference to the attached drawings, in which:

- figure 1 is a partial front elevated view of a lighting device produced according to the present invention, in which
- figure 2 is a plan view of a disassembled detail of the device in figure 1;
- figure 3 is a rear elevated view of the detail in figure 2, when assembled;
- figure 4 is a lateral elevated view, in cross-section according to a plane IV-IV of the assembled detail in figure 2;
- figure 5 is a plan view, in cross-section according to a plane V-V, of the assembled detail in figure 2;
- figure 6 is a lateral elevated view of the detail in figure 2, when disassembled, and represented in the stamping position;
- figure 7 is a lateral elevated view, partially in cross-section, of the assembled detail in figure 2; and
- figure 8 is a lateral elevated view, in cross-section according to a plane VIII-VIII, of the device in figure 1, shown only partially, for the sake of convenience.

[0017] With reference to figures 1 and 8, 1 indicates as a whole a lighting device, which comprises a support body 2 (represented by a broken line), a plurality of lamps 3 supported by the support body, a lens 4, an internal supply circuit 5 which is connected electrically to the said lamps 3, and a device 6 for connection to an external supply line, which is not shown for the sake of convenience.

[0018] The connection device 6 comprises a pair of connection tabs 7 and 8, which are connected electrically to the internal supply circuit 5, and a connector body 9, which is provided with a first and a second socket 10 and 11, which are disposed at right-angles relative to one another.

[0019] As illustrated in figures 1 to 7, the sockets 10 and 11 are provided respectively with a first and a second pair of plate contacts (the contacts of the first pair are indicated as 10a and 10b, whereas the contacts of the second pair are indicated as 11a and 11b).

[0020] The contacts 10a and 11a are integral with a first punched plate 12, whereas the contacts 10b and

11b are integral with a second punched plate 13 (figures 2, 4 and 5).

[0021] The punched plates 12 and 13 are substantially in the shape of an "L" (figure 4), such that the contacts 10a and 10b, and the contacts 11a and 11b are disposed at right-angles relative to one another.

[0022] The contacts 10a and 10b can be inserted in a removable manner in the support body 2, via respective slots 14a and 14b, in order to reach the connection tabs 7 and 8 (figures 1 and 8).

[0023] The connection tabs 7 and 8 are produced as extensions which are integral with the internal supply circuit 5, and are bent a first and a second time, such as to constitute resilient projections.

[0024] The tabs 7 and 8 are disposed inside respective seats 15 and 16, which are defined inside the support body 2, between walls 17 and 18 and a guide element 19, which extends integrally with the support body 2, parallel to the walls 14 and 15, and is produced from insulating material (figure 1).

[0025] When the connector body 9 is not in the position of use, the tabs 7 and 8 are disposed flush against the guide element 19.

[0026] Together with the guide element 19, the bent ends 20 and 21 of the tabs 7 and 8 form respective stress raisers 22a and 22b, for insertion of the plate contacts 10a and 10b.

[0027] In addition, the guide element 19 can receive in a sliding manner the plate contacts 10a and 10b, when the latter are inserted in the slots 14a and 14b.

[0028] In use, the plate contacts 10a and 10b are interposed between the guide element 19, and the connection tabs 7 and 8 respectively, with which they co-operate in a sliding manner, in order to connect electrically the internal supply circuit 5, and the external supply line. With reference to figures 1 to 7, the connector body 9 comprises a box-type body 23, with a substantially parallelepiped shape, in which there are provided a first and a second aperture 24a and 24b, in opposite surfaces of the box-type body 23.

[0029] The box-type body 23 is also provided with a pair of parallel through-guides 24c and 24d, in the vicinity of the second aperture 24b, on a surface which is adjacent to, and is disposed at right-angles relative to, the latter.

[0030] The punched plates 12 and 13 can be inserted respectively in the guides 24c and 25d, through the second aperture 24b, such that the contacts 10a and 10b project outside the first aperture 24a, by an extent which is sufficient to allow them to be inserted in the slots 14a and 14b.

[0031] The contacts 11a and 11b are inserted in additional slots 25a and 25b, which are provided in a median wall 26 of the box-type body 23, and are disposed in the vicinity of the first aperture 24a, such as to be able to receive a corresponding connector, which is connected to the external supply line.

[0032] The box-type body 23 is also provided with a

cover 27, which is connected to the body by means of a plastic hinge, and can close the second aperture 24b (figures 2, 4, 6 and 7).

[0033] The cover 27 is snapped on, by means of locking tabs 28 and 29, which are integral with the cover 27 itself, and corresponding teeth 30 and 31, which are supported by the box-type body 23.

[0034] The cover 27 can also keep the said plate assembly retained against a stop portion 32 of the box-type body 23.

[0035] In use, the connector body 9 as a whole is held snapped against the support body 2, by means of a set of four locking tabs 33, 34, 35 and 36, which are provided with respective teeth 37, 38, 39 and 40.

[0036] These tabs 33 to 36 are integral with the support body 2, from which they extend upwards in a projecting manner.

[0037] The tabs are disposed adjacent to one another in pairs, edge-wise relative to opposite outer surfaces 41 and 42 of the support body 2 (figures 1 and 8).

[0038] In particular, the tabs 33 and 34 are disposed in the position of the wall 41, whereas the tabs 35 and 36 are disposed in the position of the wall 42.

[0039] In use, the plate contacts 10a and 10b are introduced into the slots 14a and 14b, through which they reach the connection tabs 7 and 8, such as to establish an electrical connection with the internal supply circuit 5.

[0040] The contacts 10a and 10b are inserted parallel to the direction determined by the slots 14a and 14b.

[0041] During the insertion operation, the locking tabs 33-36 bend towards the exterior, in order to permit passage of the box-type body 23, until the latter comes into contact with the support body 2.

[0042] When the box-type body 23 has reached its own position of use, the tabs 33-36 close, and keep the body snapped into this position by means of the respective teeth 37-40.

[0043] The socket 11 receives a corresponding connector of a known type, which is derived from the external electrical line, in order to complete the connection of the lighting device 1 to the socket.

[0044] Finally, it is apparent that modifications and variants which do not depart from the protective context of the present invention, can be made to the lighting device 1. In particular, the sockets 10 and 11 can be disposed aligned, instead of at right-angles relative to one another.

[0045] Consequently, the pairs of contacts 10a, 10b and 11a, 11b can also be produced aligned, using flat plates.

[0046] In addition, the shape and number of the tabs for connection of the internal supply circuit 5 to the contacts 10a and 10b can be varied.

[0047] For example, it is possible to use two pairs of tabs which are produced as opposite resilient projec-

tions.

[0048] In this case, each of the contacts 10a and 10b is inserted between a corresponding pair of tabs, by which it is retained, such that the guide element 19 is superfluous.

Claims

1. Lighting device, in particular a third stop light for vehicles, which comprises a support body, a plurality of lamps, which are supported by the said support body, an internal supply circuit, which is connected electrically to the said lamps, and a device for connection to an external supply line; the said connection device comprising at least one pair of connection tabs, which are electrically connected to the said internal supply circuit; characterised in that the said connection device comprises a connector body, which is provided with a first and a second socket; the said first and second sockets being disposed at an angle relative to one another, and comprising at least a respective first and second pair of plate contacts; the said first pair of plate contacts being insertable, in a removable manner, into respective slots in the said support body, in order to reach the said tabs.
2. Lighting device according to claim 1, characterised in that the said first pair of plate contacts, and the said connection tabs, co-operate in a sliding manner, in order to connect electrically the said internal supply circuit and the said external supply line.
3. Lighting device according to one of the preceding claims, characterised in that the said support body comprises a guide element, which is produced integrally from an electrically insulating material, and can receive flush against it the said connection tabs, in the absence of the said plate contacts; the said guide element also being able to receive in a sliding manner the plate contacts of the said first pair of contacts, when the said contacts are inserted into the said slots.
4. Lighting device according to claim 3, characterised in that respective ends of the said tabs are bent, in order, together with the said guide element, to form stress raisers for insertion of the said first pair of plate contacts.
5. Lighting device according to any one of the preceding claims, characterised in that the said connection tabs are produced integrally as an extension of the said internal supply circuit.
6. Lighting device according to any one of the preceding claims, characterised in that the said first and second pair of plate contacts are disposed such as to form a right-angle relative to one another.
7. Lighting device according to any one of the preceding claims, characterised in that the said first and second pair of plate contacts are produced integrally, respectively with a first and second punched plate, which are substantially in the shape of an "L".
8. Lighting device according to any one of the preceding claims, characterised in that, in use, the said connector body is kept snapped against the said support body, by means of first locking means; the said first locking means comprising a plurality of tabs which are produced integrally with the said support body.
9. Lighting device according to any one of the preceding claims, characterised in that the said connector body comprises a box-type body, which has a substantially parallelepiped shape, and is provided with a first and a second aperture, in opposite surfaces of the said box-type body; the said box-type body also being provided with a pair of parallel through-guides, which are provided in the vicinity of the said second aperture, on a surface which is parallel to, and is disposed at right-angles relative to the latter.
10. Lighting device according to claim 9, characterised in that the said plates can be inserted between the said pair of guides, through the said second aperture, and such that the said first pair of contacts projects to the exterior of the said pair of guides, by an extent which is sufficient to allow the contacts to be inserted into the said slots; the said second pair of contacts being disposed in the vicinity of the said first aperture, such that they can receive a corresponding connector, which is connected to the said external supply line; the said plate assembly also being retained against a stop portion of the said box-type body, by a cover of the said box-type body, which is connected to the latter by means of a hinge, and can be disposed and secured such that it closes the said second aperture by means of second locking means.

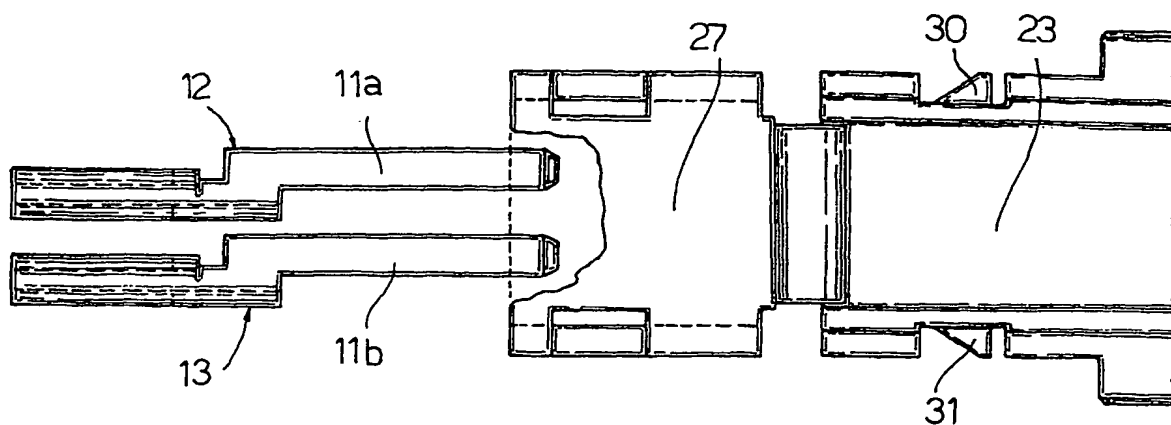


Fig. 2

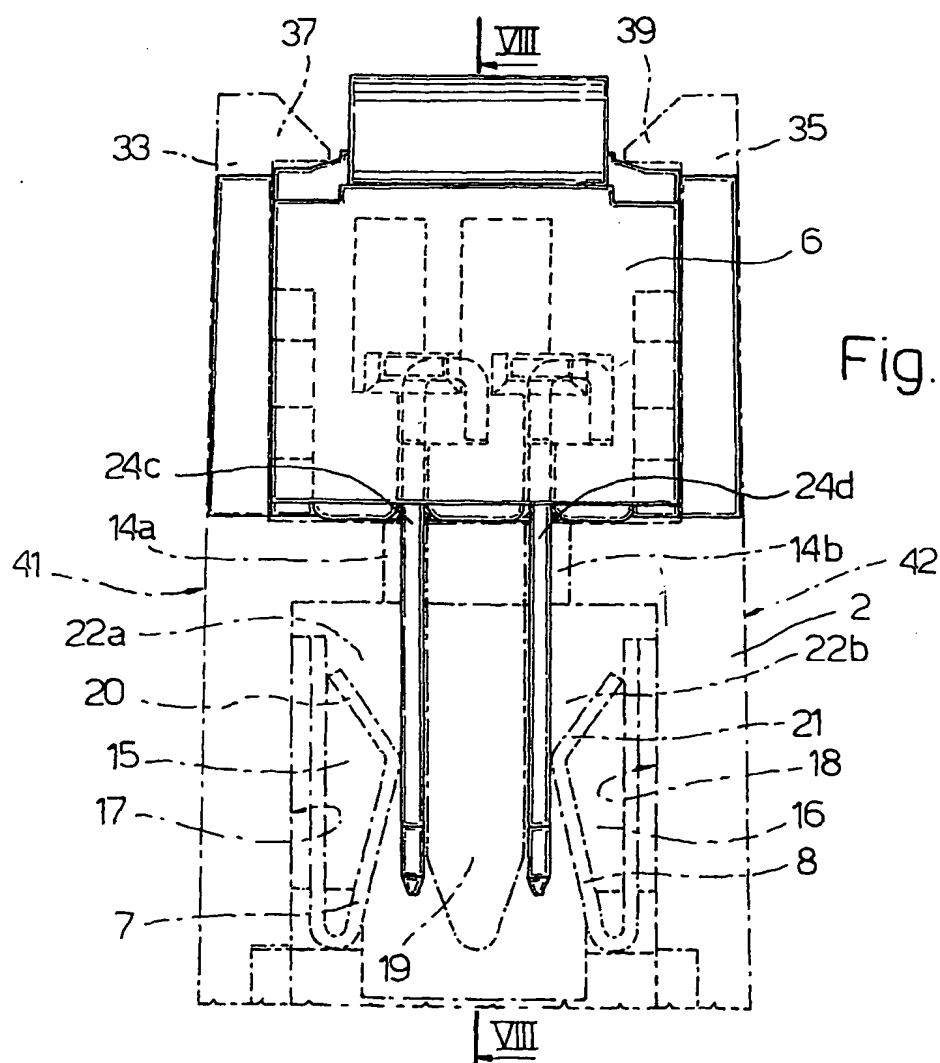


Fig. 1

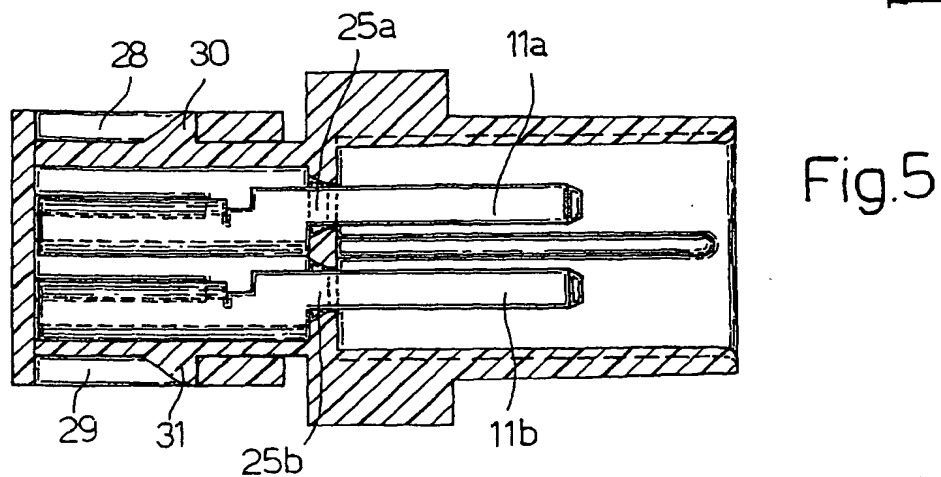
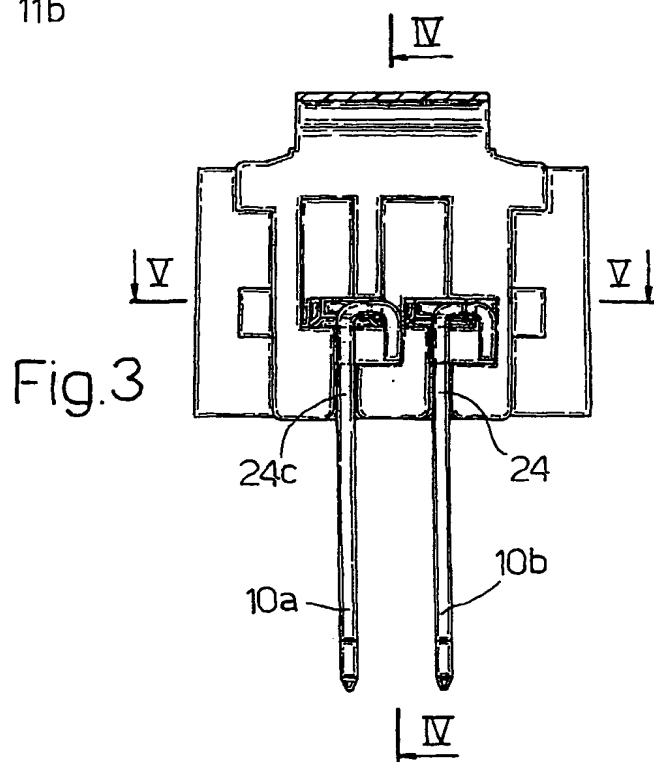
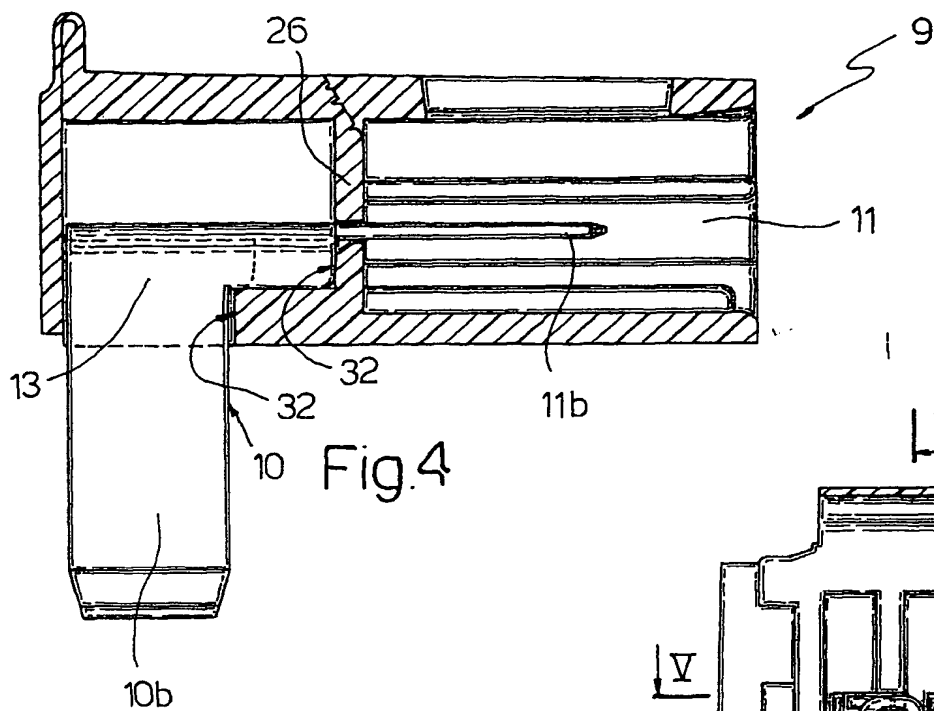


Fig.6

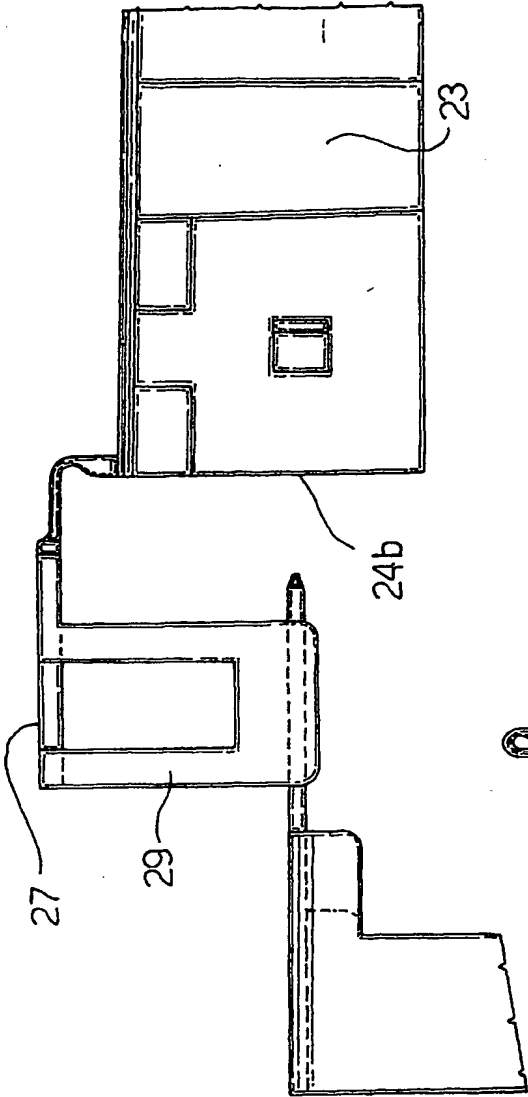


Fig.7

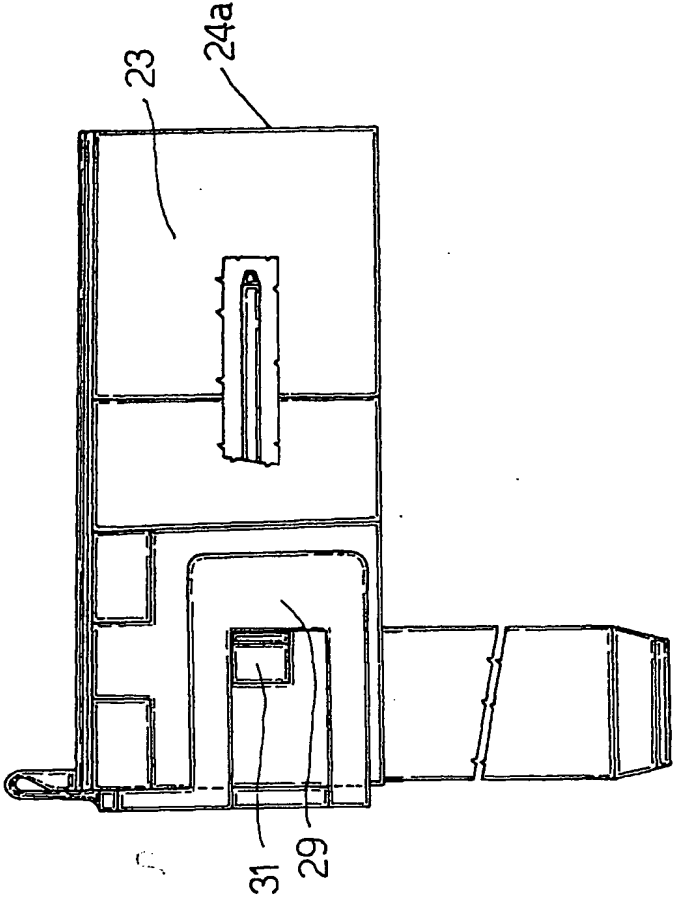
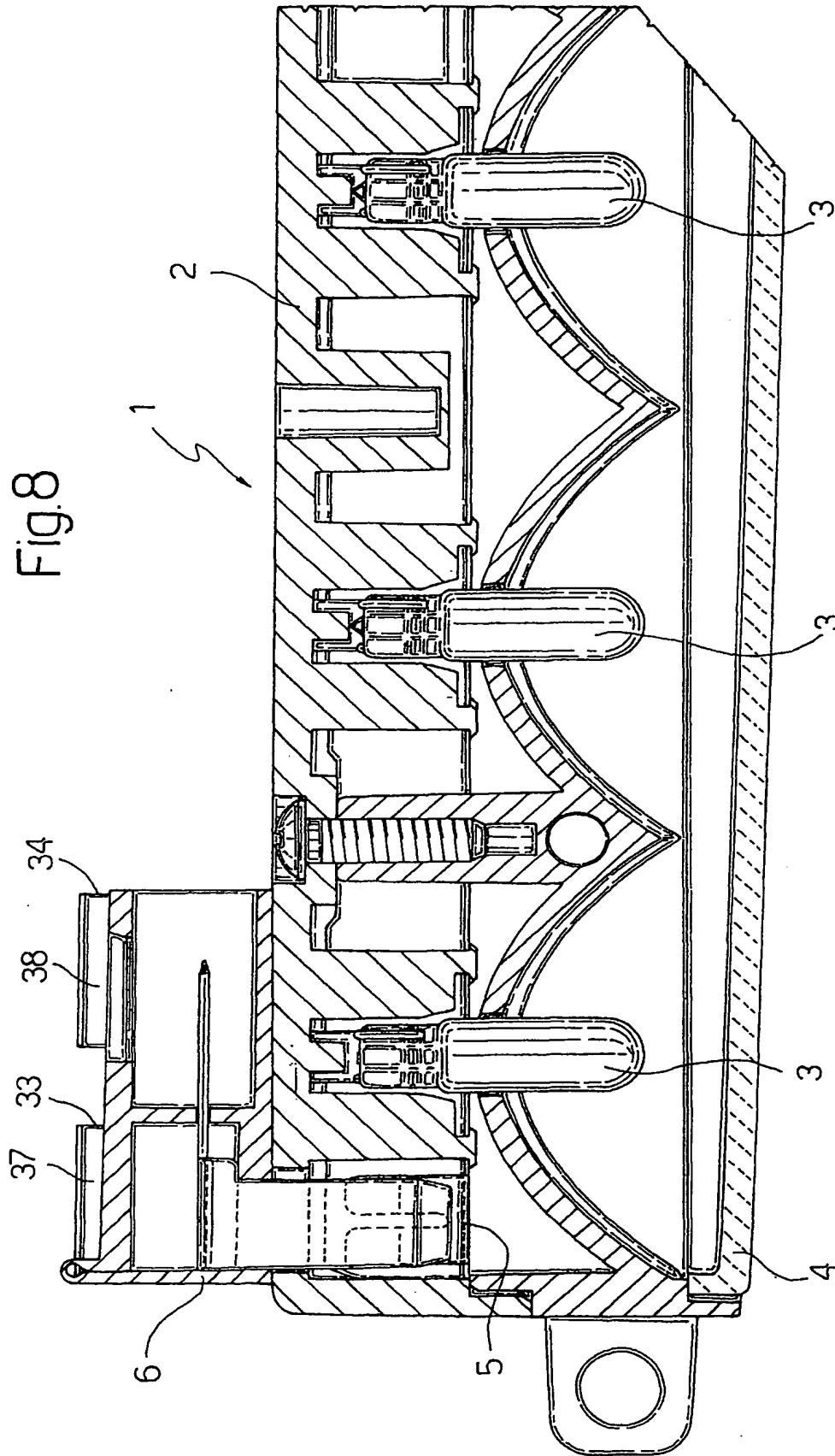


Fig.8





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Application Number
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Place of search THE HAGUE		Date of completion of the search 11 February 2000	Examiner Salojärvi, K
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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